IMPLEMENTATION AND EVALUATION OF OFFICE AUTOMATION PROJECTS

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Prepared For:
LEVI STRAUSS COMPANY

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EXHIBITS

1 EXECUTIVE SUMMARY

I EXECUTIVE SUMMARY

A. IBM 5520 ADMINISTRATIVE SYSTEM

- Interviews with a very few users of the system have expressed a high level of satisfaction with this product.

  - Interviews were with actual users of the system rather than with managers or executives.

  - Both performance and features appear very attractive.

  - Installation ease and support appear to be above average.

  - The system is being used for clerical activities in interviewed installations.

- In Levi Strauss International (LSI), initial placements of the work stations are in Corporate Management Systems (CMS-1). The objective, with which INPUT concurs, is to get experience of use outside CMS-1 as rapidly as possible.

- Justification of the system in terms of clerical workload and turnaround has been made by other installations. Probably LSI will be able to obtain at least 20% increase in productivity and more flexibility in the operations concerned.

- Additional justification in terms of document storage and retrieval, and use in communications appears difficult with the current configuration. Its potential use as a personal system by professional/management people appears limited, particularly following recent personal system announcements.

- A major objective for the program is to obtain experience on this type of system for transfer within the company. The benefits of this are extremely difficult to quantify: however, it is known that very expensive mistakes can be made in equipping an organization with systems without the type of pilot being tested at LSI.

- INPUT strongly recommends involvement of the operators in the project as soon as possible. They should be presented with brief objectives of the pilot and involved in the measurement process.

- The measurement process associated with the IBM 5520 and similar systems should have three main components:

  - Cost displacement, of people and services.

  - Value added, of improved turnaround or management information.

  - Technological imperative, keeping up with the "leading edge" competition.

- In order to fully apply this process, LSI should analyze the current and projected distribution of office costs in the areas affected by any proposed system. These costs should include not only clerical labor and supplies, but professional, technical, and managerial labor as well.

B. OFFICE AUTOMATION

- The current goals of "office automation" are often to improve traditional paper processing. However, the most significant benefits will come from making communications and creative work in the office more efficient.

- Competition by vendors in office products is accelerating.

  - Approximately $1 trillion is spent on office operations in the U.S.

  - Less than 10% of this amount is spent on computer/communications technology to support office personnel.

  - This amount will increase and the resulting large market will attract new vendors and arrays of more powerful systems.

- Few buyers have established responsibility for planning, testing, selecting, installing, integrating, and maintaining these systems. They are falling "in the crack" between DP and administration in many companies.

- INPUT strongly recommends that the Corporate Management Systems function become responsible for these processes because of:

  - Understanding of technology developments.

  - Ability to apply them effectively.

  - Ability to evaluate and measure such systems.

  - Understanding of the integration problem.

- The choice of new products in the office systems area is becoming increasingly difficult because of the variety of types of products as well as brand names.

- Standardizing on IBM equipment as LSI has done reduces the confusion.

- Also, IBM will participate in all aspects of office systems thus providing LSI with expansion paths.

- However, because of multiple approaches from IBM there is still the possibility of incompatibility, contention, and confusion.

- Standardizing on one manufacturer's product, even IBM's or Xerox's, does not obviate the need for sound central planning and control. Indeed it emphasizes it because of the "eggs in one basket" syndrome.

- INPUT recommends the establishment of a Corporate Information Management Committee to guide Corporate Management Systems in its task of installing office systems.

  - Ensure projects are installed and evaluated on a comparable basis.

  - Assist in communications on office systems projects, particularly emphasizing benefits.

  - Involve management and professional staff in new ways of performing their roles.

- CMS management within LSI has recognized the need to provide automation support to managers and professional people and not simply to "produce more paper, faster" as most office automation projects are designed to do. The IBM 5520 is a step in this direction which should be followed assiduously. The "technological imperative" inherent in today's developments can be applied effectively in LSI with sound planning and management.

II AN INTRODUCTION TO OFFICE AUTOMATION

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- Currently, the terms "office automation" and "office of the future" have not been defined.

  - Based on past INPUT research, the great majority of data processing managers believe office automation and word processing are synonymous.

  - It is also possible to make a logical argument that all commercial data processing applications have automated office operations.

  - Others feel that the elimination of paper is the key to both office automation and office of the future. Therefore, the office of the future becomes a paperless office.

- Historically, technical terminology has remained quite fluid as long as the technology is primarily theoretical. At the point where general application becomes feasible, the terms require more specific definition. Based on current efforts to describe the application of computer technology to the office, it is obvious that the office environment is on the brink of some fundamental changes.

- During the past year, INPUT has done numerous studies in the general area of office systems. Since there was no clear definition of office automation and

office of the future, it was necessary to create definitions. These definitions will be used in this report.

- Office Automation is defined as the application of a set of products and services to improve existing paper based systems and procedures.

- Office of the Future is used to describe the application of new products and services that will cause fundamental changes in existing office systems and procedures.

- Therefore, most products today address office automation.

  - Word processing equipment can improve the production of paper documents; and if communications are added can speed the delivery of a paper document to another location.

  - Office copiers fall into the same category as word processing equipment.

  - Computerized telephone systems speed dialing and collect messages but do not cause any fundamental change in the way office personnel communicate.

  - Electronic mail systems can be a significant improvement over the U.S. Postal Service, but then only improve the flow of paper.

- Since data processing management normally takes a very limited view of office automation, the focus being primarily on word processing, it is generally felt that the office of the future is so far off that it warrants no attention. This could be an extremely costly error in judgment. INPUT believes technology is progressing so rapidly that the products and services necessary for the office of the future will arrive before most companies have exhausted the potential of office automation. A current example will illustrate this point.

- In early 1980, INPUT published a vendor watch report on image processing (Image Processing Systems - Concepts and Status) which went to some length to explain that the report was not mere "blue sky" speculation. Three reasons were given for projecting that advances in image processing were imminent.

- The first reason was the existence of an installed, cost effective system at the Central Bank of Belgium. This system is depicted in Exhibit II-1 and it demonstrates not only cost effective image processing but it also falls into the office of the future category by INPUT's definition.

  - As paper documents arrive in the mail room a camera digitizes the page images.

  - The digital images are then analyzed and compressed by a minicomputer. Using pattern recognition techniques, the minicomputer extracts critical information for entry into a conventional encoded data base on disk storage.

  - The minicomputer also performs data base management functions:

    . To determine the level of storage in the hierarchy, i.e., frequently used documents are stored on disk, and less frequently used documents are stored on videotape.

    . To enable the operator to retrieve information from encoded data bases and, using a split screen CRT, page images of the original documents.

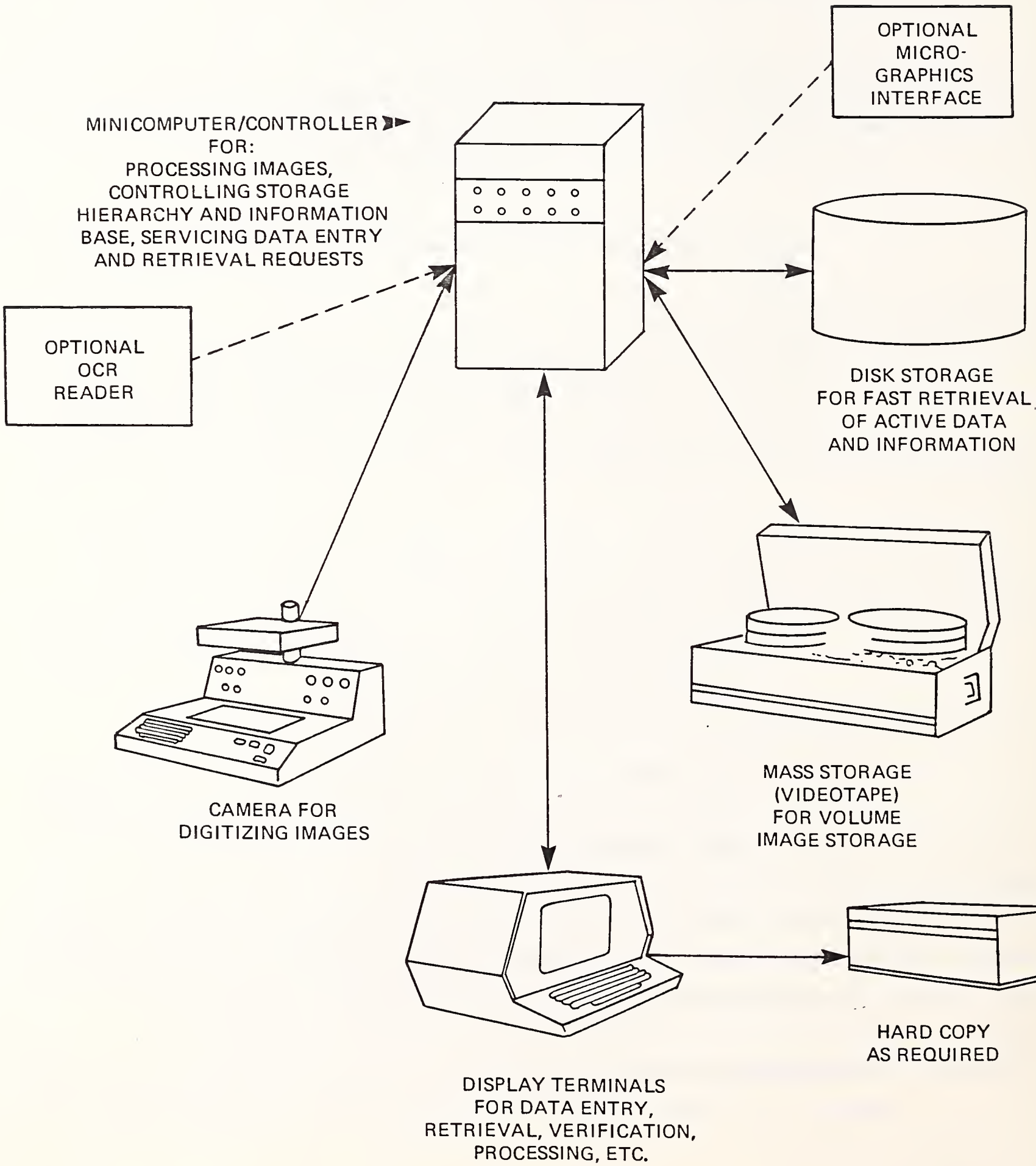
  - This system has made obsolete the traditional handling of paper documents. It was designed and implemented primarily with off-the-shelf hardware, and some creative systems development.

- The second reason for believing that it will soon be possible to make radical changes in the office environment is because of technological advances in

EXHIBIT II-1

VIPS - 2000

VIRTUAL IMAGE PROCESSING SYSTEM



mass storage. While the system depicted in Exhibit II-1 used videotape for mass storage, the potential of videodisks (or optical mass storage systems) is even more exciting. Videodisk storage is substantially cheaper than paper for archival storage - to say nothing of the elimination of paper handling in the office.

- The third reason for believing that dramatic changes will occur in the nature of office work was the soon to be realized potential of satellite and terrestrial broadband communications capability; it will be economically feasible to substitute electronic media for paper when distributing massive quantities of information.

- When installing office automation products and services, it is important to understand that major technological changes are going to occur during the life cycle of the products. It is extremely important to maintain flexibility if early obsolescence is to be avoided. Office automation is seen as the most rapid growth area for computer/communications technology in the 1980s, and there will be substantially more alternatives available than ever existed for conventional computer systems.

III VENDOR STRATEGIES

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A. GENERAL STRATEGIES

- It is estimated that approximately $1 trillion is being spent on office operations in the United States. Less than 10% of this amount is being spent to support office personnel with computer and communications technology. This potential market is so large that it is attracting new vendors; not only from the usual new, small, computer-oriented enterprises, but from among very large established companies in other fields. For example, both EXXON and Sun Oil have invested in subsidiaries related to the office market.

- At the present time, there are multiple distribution channels for office automation products and services. These channels are related to the myriad products and services related to the office:

  - Large computer systems.
  - Telephone services.
  - Timesharing systems.
  - Outside computer services.
  - Word processing systems.

- Office copiers.

- Electronic message services.

- Small business systems.

- Personal computers.

- Few companies have established central responsibility for the testing, selection, installation, integration, and maintenance of these systems. However, within the next few years it will be desirable (or perhaps necessary) to have all of these products and services communicating over a common network. Most vendors ignore this in the rush to carve out a niche in the market.

- There are currently three vendors who stand above all others in terms of current products and services, and also resources to penetrate this market: IBM, AT&T, and Xerox. While the battle of the giants proceeds slowly through the legislative and regulatory processes, as aspects of who can do what and to whom, other vendors are proceeding to establish their position in the competition.

- The merging of computer and communicating technologies has dictated the strategies of most vendors. These strategies are best described as the development of multifunction equipment, and have resulted in the following:

  - Equipment designed primarily for word processing which can be used for fundamental data processing applications.

  - Small business systems (and personal computers) which can be used for word processing.

  - Computerized telephone exchanges which can be used for message services, as well as voice and data.

- Office copiers which can be used for information distribution and for communication with word processing and data processing systems.

o The list of alternatives is practically endless, and the confusion being generated in the marketplace is exceeded only by the technical confusion which will result when users attempt to integrate this "hodge podge." It should be pointed out that all vendors have a vested interest in maintaining market chaos as their product and service plans evolve.

B. IBM STRATEGY

- In many ways, Levi Strauss has selected the line of least confusion by standardizing on IBM equipment. IBM has recognized that in order to maintain historic growth in both revenues and earnings, it must achieve substantial penetration in all phases of office automation during the 1980s. (With revenues of $6.9 billion and earnings of $804 million in the second quarter of 1981, achieving this degree of penetration will be a challenge even for IBM.)

- The U.S. market for products and services to support office personnel breaks down as follows:

  - Data processing, word processing, and office copying (where IBM is active) represent 36% of the expenditures.

  - Voice communications (including data), mail and courier, and message services (where IBM is not a significant vendor) represent 64%.

- IBM has been aware of the importance of communications for some time. When Satellite Business Systems was formed over a decade age, IBM stated it was investing because the common carriers "were not providing the services required by our customers." In penetrating the communications side of office systems, IBM has two alternatives:

- Replacement of existing services by computer-based systems such as electronic mail.

- Displacement of current costs for the switched network by providing value added services such as integrated digital networks.

- INPUT believes that IBM will pursue both courses of action vigorously during the 1980s. Therefore, IBM will participate in all facets of office automation, and will also focus its attention on the office of the future.

- However, for the last four or five years, IBM corporate management has been practicing "management by contention" between the Data Processing Division (DPD) and the General Business Group composed of the General Systems Division (GSD) and Office Products Division (OPD). This has resulted in DPD attempting to exercise account control through the central data processing function while GSD and OPD are providing alternatives for smaller establishments and end users within the client enterprise. The resulting confusion has disturbed some customers (especially corporate data processing management), but it has resulted in IBM being able to approach office automation from the top down (distributed data processing) and from the bottom up (standalone small business systems and various office products).

- These competing approaches may experience compatability difficulties, but IBM will at least be able to say it has the right answer since all alternatives have been proposed.

- Many clients have expressed dissatisfaction with IBM's strategy; a year ago IBM issued an Information Bulletin for customers which stated:

  - "It has been IBM's practice to develop a variety of solutions to meet the broad spectrum of user applications requirements. The System/370 Distributed Office Support System (DISOSS), the System/370-8100 Distributed Office System, the 5520 Administrative System, the Displaywriter System, and the 6670 Information Distributor are recent

examples of product optimized to meet differing office systems' text requirements."

- "IBM recognizes that many users will require communications capabilities to integrate these products into their information handling systems. Communications support must be available so that test documents that require filing or transmission can be sent to, or retrieved by, authorized individuals throughout an enterprise."

- "It is IBM's intent to provide support, over time, of this document interchange capability across these office systems offerings. More specific information as to this intent is available from your IBM marketing representative."

- There are two things wrong with this statement: the intent to provide support "over time" does not help a great deal for clients attempting to put together a long-range plan. And, nothing has really been done about competing IBM marketing representatives. The "Information Bulletin" is more a plea for faith that everything is eventually going to work out.

- Without questioning IBM's corporate intent to do what it says, it is important to understand that there are significant differences of opinion within IBM about what should be done. Some sources within IBM indicate the battle may continue to rage for the next four to five years. Therefore, it is of the utmost importance for organizations - even those committed to IBM - to lay out a plan which will anticipate the organization's information requirements and minimize the risks associated with incompatability.

- Thus relying on IBM as a sole vendor will not eliminate incompatibility, contention and potential confusion.

IV ORGANIZATION FOR THE MANAGEMENT OF OFFICE AUTOMATION

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- A major organizational change has occured within Levi Strauss since this project was initiated. Time constraints associated with the study did not permit an analysis of the organization.

- In addition, it is helpful to be able to discuss organization as an abstract problem. As was stated in Managing the Integration of Office Automation in the EDP Environment, INPUT, November, 1980: "Practically any organizational structure can be effective provided all of the personnel involved understand and work towards a common goal. Unfortunately, in many cases, the area of office automation represents the antithesis of this situation."

- This was felt to be true for two reasons:

  - The problems of office automation are not understood by those involved in implementation.

  - There is contention among various parts of many organizations concerning the implementation of their perception of office automation.

- While any organization might work, there are several things which can be expected to facilitate the implementation of office automation.

  - For several years INPUT has urged that a single corporate telecommunications function should handle voice, message, and data

communications. This function should report directly to the highest systems position in the enterprise. This emphasis on telecommunications is in recognition of the fact that the communications network is more important than the processing taking place at the nodes.

- INPUT has also recognized the disinclination of data processing management to become involved in much of the detailed systems analysis necessary to implement office automation. Because of the press of conventional data processing projects, this reluctance is understandable. However, in most companies, data processing personnel are the most qualified to perform the type of systems analysis required to install information networks.

- It is INPUT's opinion that the organization of the data processing function must change during the 1980s. For those DP organizations which accept the added responsibility of designing and installing information networks, the function will assume added importance in the day-to-day operation of the company. For those organizations which do not accept the challenge of office automation, the data processing function will become primarily custodial in nature and isolated from the operation of the enterprise.

- It has also been INPUT's opinion that it is essential to have operating management intimately involved when proceeding toward the office of the future. The major roadblocks in implementation of information networks are associated with the paper-oriented systems and procedures of the past. When starting to implement office automation, a matrix organization is usually essential. In fact, in many cases it is desirable to leave all of the intra-establishment systems work to the end users while the information systems function addresses the communications interfaces among various establishments (offices) within the enterprise.

- While the above may seem like gross generalizations, it is surprising how frequently they are ignored when pilot projects are installed and office automation plans are developed. In 1980, thirty large companies were interviewed concerning their plans for office automation. The results are depicted in Exhibit IV-1. The responses clearly indicate the lack of planning in the office automation.

  - Only four repondents have a documented plan.

  - Most are on the brink of beginning to develop such a plan (21 of 30 respondents). Good intentions seldom work out in actual practice - our annual survey of computers/communications users reveals that there are a number of things which are always put off from year to year.

  - Perhaps the most revealing fact is that 13 companies are in the process of implementing office automation without a plan. While this may not dictate failure, it certainly has a high probability of being extremely expensive.

- One of the primary reasons many companies are proceeding with office automation without a plan is because organizational responsibility has not been established. Since Levi Strauss is currently undertaking various projects in office automation, a central planning function should be of high priority if this has not already been done.

- Most data processing managers are hesitant about stepping into the office arena because it is much more sensitive and "political" than data processing. Data processing has many elements which are outside an end user's purview - not so with the end user's office functions which in many cases are his or her reasons for employment.

EXHIBIT IV-1

WHEN OFFICE AUTOMATION PLANS WILL BE DEVELOPED AND IMPLEMENTED

PLANNING STATUS	NUMBER OF RESPONSES
CURRENTLY HAVE DOCUMENTED PLAN	4
WILL DEVELOP SUCH A PLAN,	
1980-1982	16
AFTER 1982	1
NEVER	3
DON'T KNOW	10
WILL BEGIN TO IMPLEMENT THAT PLAN	
1980-1982	21
AFTER 1982	2
NEVER	1
DON'T KNOW	6
IMPLEMENTATION IN PROCESS	
WITH A PLAN	0
WITHOUT A PLAN	13
THE PLAN CALLS FOR (WOULD CALL FOR) INTEGRATION OF DATA AND WORD PROCESSING	21

V PILOT PROJECT INSTALLATION

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A. ANALYSIS OF PROPOSED PROJECT

- Organizational and personnel changes have occurred since the IBM 5520 project was initiated. The comments and recommendations in this report are based on an examination of the project during these changes and on the experiences of some of INPUT's clients.

- When making the proposal for this project, it was hoped that INPUT could be useful in assisting in the design of the project, at least in assigning the placement of work stations. Since this has not been possible for a number of reasons, including the imminent physical move(s) which will take place, the following comments are offered concerning the pilot project:

  - It would have been desirable to place at least some of the work stations outside of CMS-1.

  - It would have been advisable to have the placement of the work stations discussed with the personnel involved at the earliest possible time. (This still had not been done when report preparation was started.)

  - For purposes of evaluation, it is essential to have detailed knowledge of all personnel duties and performance. Only a rough evaluation of three of the six operators was available.

- It does not appear that there has been much coordination of the 5520 pilot with the Displaywriter and 8100 project.

- The minimum monthly charge for the 5520 System is approximately $3,000: this means that the cost is $500 per station. Estimates obtained on three of the work station locations indicated that between 20-50% of the operator's time is spent on typing. Assuming an average of 35% may apply to the six positions, and that the system will double typing productivity, it will save 17.5% of the operator's time at each station. Since each station costs $500 per month, monthly labor expense of a work station operator would have to be approximately $2,860 before break-even would be reached.

- In discussing the relative merits of standalone word processing systems against shared logic systems, it was pointed out that, depending on the specific applications, printing can be a problem - the system requires operator attention and time spent by the operator can add significantly to the overhead costs associated with the shared logic systems. It is our understanding that two printers will be installed - one on the fifth and one on the sixth floor of CMS-I's 340 Market Street location, and the 5520 controller will be placed in the computer room on the fifth floor. Several things about this arrangement should be of concern:

  . Responsibility for the printers will rest with the individual users for operation and general maintenance (paper changes, etc.). While this particular arrangement may hide certain overhead expenses, it can lead to priority and maintenance problems which may destroy the convenience aspect of the system itself (to say nothing of the true cost of operation).

  . The principal operator of the system will be Ms. Elentery who will be in a key secretarial position, new to the company, and physically removed (by one floor) from one of the printers and the 5520 controller. Depending upon the amount of time

required, this could also impact the secretaries' primary tasks and become hidden costs of the system.

- Therefore, the pilot does not (at present) seem to have clearly defined and measurable objectives if viewed as a word/text processing system.

- Of course, the 5520 Administrative System has more potential than a standalone word processing system. After discussions with the IBM General Business Group, it was concluded that the document storage and retrieval capabilities must be exercised if the system is to be cost justified against other alternatives.

  - The centralization of the pilot project within CMS-I precludes any significant benefits resulting from document distribution. More specifically, four of the six work stations will be located in adjoining offices where the value of using the systems for communications must be negligible.

  - Rudimentary applications such as calendaring and form letters are insufficient justification for the 5520 in a single organizational and physical unit.

- The only justification is to have management intimately involved in the pilot project. The fact that money is being spent for project evaluation obviously suggests commitment, but it is not apparent that very much thought has gone into the first phase of this project. The key to success in office automation is having professional and management personnel involved. This is difficult even when the project is confined within the data processing function.

B. RECOMMENDED ACTIONS ON THE PILOT PROJECT

- Regardless of the status of the current project or organizational considerations, CMS-I should exercise leadership in establishing a corporate-wide coordination group for evaluating various office automation projects.

- The 5520 project should be extended out of the CMS-I local area as soon as possible to facilitate interoffice communications both within LSI and with organizational entities which interface closely with LSI.

- The operators should immediately be presented with objectives for the pilot project.

  - Specifically, the need for exercising <u>their</u> initiative in selecting and testing new applications should be stressed.

  - Emphasis should be placed on improved productivity, particularly related to management and professional tasks, as opposed to cost reduction.

  - Operators should be made to understand they are on the leading edge of office automation technology, and will be expected to provide leadership as such systems are extended throughout the enterprise. They should also understand that their professional development is being encouraged by having the opportunity to participate in the project.

  - An informal group should be established so that participants in various office automation projects can exchange ideas. In other words, crossfertilization should be encouraged, not only with a management review function, but at a working level.

- Installation of a pilot project in office automation must have a specific plan for both expansion and evaluation, and operating employees should be involved

from the beginning. Part of this involvement should be evaluation of the overall information flow within the enterprise and how it can be improved with or without new technology. In other words, during training operators should feel they are involved not only in the use of new technology but in the improvement of existing communications channels as well. Provision should also be made to acquaint other personnel with the use of the equipment.

- During this process, the selection of additional work stations should be considered, with emphasis on those areas concerned with technical and repetitive text preparation.

- Even before installation, the selected employees should be evaluated in terms of their current performance, and this should be continued throughout the pilot project.

- In addition, non-clerical personnel should be involved in the effort. Explain that office automation is more than word processing and that the 5520 has additional capacity. Professional and management personnel should be encouraged to contribute to the success of the project - and also its evaluation. For example, if the system eases the clerical burden but increases turnaround on the actual preparation time because of queuing problems on the printers, this impact should be assessed. Management and professional personnel should specifically be instructed that they should consider both the positive and negative impacts on their personal productivity.

- Measurement systems should therefore be established and used for management, professional, and operational staff productivity. As discussed in the next chapter such systems are difficult to implement.

C. INTERVIEWS WITH OTHER IBM 5520 USERS

1. DODSON INSURANCE
KANSAS CITY, MO.

CONTACT: BARBARA SMITH
SUPERVISOR
816-361-3400

- Total of eight display systems installed.
  - Six in DP department for text letter typing, forms, and statistical typing.
  - Two in other departments: just the display and printer with CPU hooked into word processing; being used for loss prevention and direct sales.
- Very satisfied with performance. The system "has made the job 100% easier" - now have half a day turnaround instead of one or two days.
- To evaluate the system they measure time spent on each job, both elapsed and level of effort.
  - Look at when the job comes in, time taken to type, and when it goes out.
  - Compare times now with previous experience.
- ERA in Kansas City, Mo. is also using the system.
- Dodson was the first company in Kansas City to put in the 5520.

- Completely satisfied with the system. Noted that they never get bored with it because IBM is always coming out with new releases and features.

- Very happy with the local support representatives, they always seem to have the answers to Dodson's question.

- Particularly pleased with the system because they can put the company's annual statement on it, which is page after page of statistical typing. Before they used a selectric typewriter. With the 5520 they can send the annual statement free of errors - it's great - a very clean copy with no correction fluid.

- Closing comments - feel 5520 has doubled productivity not only in word processing but in other areas of company. She (Barbara Smith) would be very happy to discuss their application with Levi Strauss.

2. CHATTANOOGA BLUE CROSS
CHATTANOOGA, TN.

CONTACT: LORETTA BISHOP
615-755-5600

- Sixteen IBM 5520 CRTs, 1 Model 50, two inkjet printers, and two impact printers.

  - They are being used for handwritten input and dictation - primarily letters and variable information.

  - Impact printers are being used for continuous letters with multiple pages.

  - Inkjet printers for one-page letters and statistical reports where good quality of type is important.

- They are extremely satisfied, "Everybody thinks it's super." "Had a few software problems at first but now everybody thinks it's great." "We like it so much we have more on order."

- To evaluate the system each person keeps a production sheet; these are compared to sheets used before the 5520 was installed.

  - The system is also programmed to give daily and weekly reports.

  - Standards department will come in November to set new standards for the department.

- Tennessee Valley Authority in Chattanooga is another user.

- Very pleased with the abilities of the system.

  - They have all kinds of report formats stored in the system - this saves very valuable time because they don't have to keep duplicating the report formats every month. Also have letters stored so all they have to do is change variables.

  - Very pleased with the performance of the system - they have two shifts of people working from 8:00 until 9:00 at night. They do the typing for 15,000 employees in the company plus typing for the branches located throughout the state. They average 50,000 to 60,000 pages per month.

  - They figure that production has increased 20% and should increase even further now that everyone is familiar with the system.

3. GLASS ROCK PRODUCTS
ATLANTA, GA.

CONTACT: MARILYN KASNO
404-433-1800

- At the moment they have one display unit which is used for financial scheduling, letter writing, and typing of the personnel manual.

- They are very satisfied; like its move and copy keys. It is simple to use and very easy to adjust to.

- No real method of evluation - just compare performance with the Lanier it replaced.

- In summary, respondent liked it because:

  - "Great screen."

  - Spell key very useful because "I'm not that great a speller" - helps in proofreading.

  - Increased accuracy - they don't do just straight typing on it but if they did, respondent is sure that production would increase because she types much faster on it.

VI EVALUATION OF THE IMPACT OF NEW OFFICE TECHNOLOGY

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A. COST ANALYSIS

- As mentioned previously, most organizations are proceeding today without a plan for office automation and with no long range view of the office of the future. One of the primary reasons for this is the fact that cost/benefit analyses are exceptionally difficult to make. Even those companies which have a plan seldom developed cost justifications prior to their initial office automation projects. In addition, it is possible to improve the efficiency of certain functions (such as typing) while reducing the effectiveness of the total office operation.

- Despite the difficulty of measuring the impact of office automation, gross estimates of cost savings are being made in many technical publications and in the popular press. These articles frequently address the productivity of professional and managerial personnel (which is the most difficult to evaluate) and some of the numbers are so large they are difficult to comprehend. For example, Computerworld published an article in 1980 which stated that office automation could save U.S. business more than $300 billion per year. Even those of us who are enthusiastic about the potential of the office of the future have difficulty with savings of that magnitude.

- The problems of cost analysis of placing new computer and communication technologies in office environments are surprisingly similar to those associated

with the early installation of computer systems in commercial environments. Three primary concepts emerge.

- Cost displacement is most clearly identified and measured.

  . The actual reduction in the number of employees performing a specific function.

  . The ability of the same number of employees to provide increased services. (The same number of secretaries serving twice as many professionals).

- Value added to the actual performance of employees is more difficult to measure. For example:

  . The ability of management and professionals to make better decisions.

  . The ability to perform new work or complete work more promptly.

  . The ability of a group or organization to be more responsive.

- Technological imperative, which can be the most difficult to assess, is a reaction to a competitive situation.

  . If Sears installs point-of-sale terminals, J.C. Penney feels compelled to do the same.

  . If a company installs a computer for inventory control, a rival will fear he may be able to reduce his costs and so will install a comparable system.

- These were generally the justifications for installing computers: initially they were installed to save money, then to make money, and then to keep up with "leading edge companies." While there are few statistics to support these observations, it can be postulated that keeping up with the technology has sold more computer hardware than detailed cost justifications.

- These three concepts have recently been identified in applying cost analysis to office automation. They have an advantage of providing a broad framework to analyze the impact of emerging office products and services. The following are examples of some representative cost savings. All are very much applications dependent.

  - Standalone word processing systems can be expected to double the typing productivity of secretaries and typists in a technical environment (such as a systems area).

  - Some centralized word processing centers have reported improvements of three times as many lines of type per month per person. For example, it has been reported that Security Pacific Bank has a word processing group of 50 operators to serve 1,000 authors; productivity has tripled, based on actual measurements. (Unfortunately, there have also been numerous cases where overhead, poor turnaround, and the desire to have a personal assistant have led to dissatisfaction with many centralized operations.)

  - Another interesting measure which has been reported by systems groups at Stanford, IBM and Xerox relates to the clerical professional ratios in organizations where the professionals have terminal access to text processing facilities. In such environments, the ratio is about 1 to 20, whereas in other environments (normal office environments) the ratio is 1 to 2.5. (Of course, the impact on professional performance must be assessed, but most professionals using terminals feel it actually saves them time to do certain tasks themselves.)

- It has also been estimated that electronic mail can save approximately two hours per day of professional and managerial time (25%). This cost displacement is for both written and oral communications.

- Putting a dollar value on the "value-added" benefits of office technology is difficult, but studies done at Cornell using a concept of "new work" performed by managers and professionals resulted in time savings of approximately $10,000 per professional year where professional employees are supported with text-handling and electronic mail services.

- The "technological imperative" is by its very nature subjective, but there are certain historical observations which point to the fact that it does, in fact, exist. For example, the current volume of business transactions involving checks and credit cards could not be handled on a manual basis. Retail and financial organizations who failed to keep up with technological advances would not have been able to provide certain new services to their customers and would have become less competitive.

B. MEASURING PILOT PROJECTS

- The most important thing for any organization to do prior to setting up a pilot project is to determine current costs. Few organizations have done this in an actual office environment, and general estimates (such as those provided by INPUT) must be refined for each individual organization. However, gross figures at least provide a general framework of the types of measurements which should be made.

- For the purposes of this report, INPUT has specified six activity groups in an effort to describe the work done by each category of worker:

- Analytical work.
- Face-to-face communication.
- Using the telephone.
- Origination of documents.
- Handling documents.

- Analytical work includes planning, designing, calculating, preparing budgets, manipulating concepts and numbers, and other generally solitary work involving thinking, reflecting, and comprehending. The use of calculators, computers and other instruments would be included.

- Face-to-face communication involves going to, coming from, and attending meetings, conferences, and seminars, giving or attending presentations, talking to others directly in someone's office or in a hallway, and other generally verbal encounters. Teleconferencing would be included here.

- Using the telephone includes inside and outside calls, including waiting time, misdials, wrong numbers, etc.

- Origination of documents includes dictation, writing letters, drafts, and reports, making sketches or drawings and tables of data.

- Handling of documents includes sorting, filing, retrieving, and routing paper or other media containing information; processing incoming or outgoing mail; making machine copies; and reading material not used in analytical activities (e.g., memos on the new parking regulations, the office party and the blood bank).

- Exhibit VI-1 shows the percentage of each worker's time spent in each of the various categories of activity.

EXHIBIT VI-1

PERCENT OF OFFICE LABOR ATTRIBUTABLE TO VARIOUS ACTIVITIES

JOB FUNCTION	ORIGINATION OF DOCUMENTS (1)	HANDLING DOCUMENTS (2)	USING TELEPHONE	FACE TO FACE (3)	TYPING	ANALYTICAL WORK (4)	TOTAL
MANAGERS AND ADMINISTRATORS	7%	2%	7%	9%	0%	4%	29%
PROFESSIONALS AND TECHNICAL	6	4	7	13	0	15	45
CLERKS AND TYPISTS	1	8	2	1	4	4	20
SECRETARIES	1	1	1	1	1	1	6
TOTAL PERCENT	15%	15%	17%	24%	5%	24%	100%
EQUIVALENT IN $ BILLION	$124	$124	$140	$198	$41	$198	$826

(1) INCLUDES DICTATION, WRITING MEMOS, LETTERS AND REPORTS, EXCLUDES TYPING.
(2) INCLUDES FILING, COPYING, ROUTING, MAIL HANDLING. EXCLUDES TYPING.
(3) INCLUDES MEETINGS, PRESENTATIONS, SEMINARS, CONFERENCES.
(4) INCLUDES DESIGN, CALCULATION, TECHNICAL READING.

- Managers and administrators spend most of their time (79%) originating or responding to communications, face-to-face or on the phone.

- Professionals and technical people spend 62% of their time doing analytical work and attending meetings.

- Clerks and typists, as might be expected, spend most of their time (60%) typing and handling documents.

- Secretaries spend an equal amount of time in each activity.

- Personnel costs for the various activities show that the greatest focus of office automation products (copiers, word processors) is on the lowest cost-contributing elements of office activity. The biggest costs in the office relate to analytical work and face-to-face communications, where nonclerical personnel spend most of their time.

- As shown in Exhibit VI-1, nearly half of office work consists of creative work; i.e., analyzing and originating documents.

  - Almost as much time is consumed by communications, either face-to-face or by telephone (telephone time is especially inefficient with only about 10% being productively spent).

  - Only one-fifth of the time is spend on classic "office" functions of typing and document handling.

  - Managers are those who have management responsibility including salary administration for other employees (this would include executives).

  - Administrators are those supervising the work of others with or without responsibility for salary administration (for example, project leaders, clerical administration, etc.).

- Professionals are those performing individual functions of a professional nature without management or supervisory responsibility (engineers, actuaries, computer consultants, etc.).

- Technical employees are semi-professonals operating on an independent basis - draftsmen, illustrators, cost analysts, production control employees, etc.

- Secretaries perform secretarial services for the above categories, including personal and administrative functions such as calendaring, etc. (distinguished from typists by assignment to specific individuals or groups of individuals and by significant telephone use).

- Individual clerks process paper - checking documents, filing, delivering documents.

- Typists - self-explanatory.

- It is strongly recommended that a similar breakdown be made for any office which will be used as a pilot project. The study should include all categories of employees regardless of whether the system being installed will be used by all of them.

- Simple forms will suffice for recording necessary information, and everyone should be assured that the cost analysis, both before and after, has the full support of management within the company.

VII A SCHEDULED APPROACH TO OFFICE AUTOMATION

VII A SCHEDULED APPROACH TO OFFICE AUTOMATION

A. GENERAL

- Before office automation pilot projects are established, a rough measure of what is happening (in terms of cost) in offices should be obtained (as presented in Section VI above).

- Since there are currently many approaches to office automation, each should have rough approximations of cost/benefit ratios. (This should be done immediately.)

- Considering the current status of projects within Levi Strauss, it is recommended that a central office automation committee be established to assure that projects are being installed and evaluated on a comparable basis. (Essentially, it should be established before the 5520 project is installed and would be called the Corporate Information Management Committee.)

- The 5520 project is limited in scope and will be difficult to justify. However, accurate measurements of impact are essential:

  - The impact on typing at work stations should be measured before and after the installation.

  - All of the cost analysis factors described in Section VI should be calculated (or estimated).

- It is exceptionally important to have administrative participation in the project analysis:

  - The station operators and their management should start communicating with each other as soon as possible. Since the major gains may be in managerial rather than clerical productivity, the possibility of calendaring, electronic mail, project analysis, and control should be understood and presented by work station operators within three months after the stations are installed in LSI.

  - While this requires management guidance, the operators (primarily secretaries) should be given an incentive to make both the installation and follow-on projects successful. In other words, they should be informed from the beginning of the project that they have a key role to play and have responsibility for the success or failure of the project. This communication between the "management committee" and the "operating committee" should be established <u>before</u> equipment is installed.

- Once the ground rules for projects are established (hopefully within the EDP function), the extension of word processing automation within the EDP function should be expanded to the operating units within the organization. A rough timetable would be:

  - The projects within the Corporate Management Systems organization should be extended through system-to-system communication within six months after the LSI 5520 installation.

- This presents a challenge for the corporate management committee, which has been recommended - it must decide how integration will take place. However, it is important that this challenge be maintained. This report emphasizes the problems associated with incompatible hardware and software. The decision

to standardize was wise; the necessity for constant monitoring will be one of the most important functions of the Corporate Information Management Committee.

- The Corporate Management Systems function should assume responsibility for office automation within the company. This should occur after effective use has been made within LSI. The most important thing to establish during that period (which is estimated to be one year) is that the problems being solved at a managerial and professional level are primarily communications oriented. This implies that:

  - EDP personnel must immediately become involved in two vital areas.

    . The cost and technical considerations associated with voice communications (and other oral communications).

    . The capability of new computer/communication technology to solve these problems.

  - This understanding and evaluation depends upon a corporate committee which includes the day-to-day participation of the corporate telecommunications function.

- Starting with the corporate systems function, operating management should be given rudimentary communication capability if only through their secretarial work stations. (This implies that "executive terminals" are still a problem, which may not be true. It is possible that the negative association of keyboards with executive offices may diminish within the next year or so. All executives use a simple keyboard, the telephone.)

- Two areas related to the office which Levi Strauss should immediately address are business graphics and personal computers:

- Graphics systems are rapidly providing new methods of communications.

- Presently they are static, but animation is appearing.

- Graphics replace thousands of characters and numbers - they sort out information from noise.

- Personal computers, or personal systems are much more attractive than work stations. They can be used for office functions. In many cases they can be used to "educate" managers and professional staff in keyboard systems use. Applications performed often replace paper systems.

- INPUT strongly recommends that Levi Strauss pursue both the above developments. They are areas where some of the greatest price-performance improvements in the computer industry are taking place. Together they presage the future personal systems which will be common executive tools in the middle 1980s.

- Within the next five years, DP management will be expected to accomplish a great deal in the area of office automation. To understand the economics leading up to the office of the future, evaluation and experimentation must begin today. The concept of "technological imperative" must be replaced with a thorough knowledge of technological impact and economics within the office environment.

- The office problems and opportunities are communications problems and opportunities: they should be recognized as such.

B. TEXT PROCESSING SYSTEM EVALUATION METHOD

- Text processing document characteristics should be organized and described using the categories shown in Exhibit VII-1.

  - Each category will have detailed tasks, as described in Exhibit VII-2.

EXHIBIT VII-1

TEXT PROCESSING - CHARACTERISTICS

DOCUMENT	PAGES	QUANTITY PER DAY	WEEK	MTH	QTR	PAGES IN THE FUTURE	AVG. NO. OF COPY	HOW COPIED
A. Internal Corres.								
B. External Corres.								
C. Interoffice Memo								
D. Form Letter								
E. Report								
F. Manual								
H. Contract								
I. Proposal								
J. Forms								
K. Financial Statements								
L. Statistics								
M. Other								

SECTION I

EXHIBIT VII-2
TEXT PROCESSING - TASKS

1. Can the forms be typed? Yes No

2. What type of present equipment are you using?

   Typewriter Telex Copier W.P. Facsimile

3. What is the extent of revision of all correspondence?

% of Corres.	No. of Revision to each draft	The % of the extent of the revisions

4. Do you use any special size paper?

   11x14, larger, European size? yes or no

5. Document merge:

   Describe any applications where you mix/intermix standard text with variable information, i.e., date, name, dollar amount, term, etc.

Application	Quantity per day	week	month	qtr.

6. Document Assembly:

   Describe any applications where you combine two or more standard paragraphs to create a letter or a response.

Application	Quantity per day	week	month	qtr.

7. Describe any applications where you cut and paste old/new texts.

Application	Quantity per day	week	month	qtr.

8. Do you have special requirements for:

		Quantity per day	week	month	qtr.
a.	Calculations				
b.	Table Creation				
c.	Symbol & Char. not on standard typewriter				
d.	Other				

EXHIBIT VII-2 (Cont.)
TEXT PROCESSING - TASKS

9. How many documents have a due date of:

Application	Half Day	One Day	Two Days	When Time Permits

10. Do you have applications where one letter must be re-typed for each recipient of the correspondence.

Application	Quantity per			
	day	week	month	qtr.

11. Do you have applications where you simply re-type computer printouts in some form or report?

Application	Quantity per			
	day	week	month	qtr.

12. Do you have applications where you merge data processing text with a letter?

Application	Quantity per			
	day	week	month	qtr

EXHIBIT VII-2 (Cont.)
TEXT PROCESSING - TASKS

SECTION II

NEED FOR FILE PROCESSING

1. Do you maintain text in machine readable form for future use?

Application	Quanity per day	week	mth	qtr

2. Do you have special requirements for microfilm or other permanent retention methodology?

Application	"	"	"

3. Do you maintain large files,(i.e., personnel lists, client lists, prices, etc.) manually which could be maintained on the IBM 5520?

Application	Size of file/record

4. Do these files need sorting, frequent update, or frequent inquiry?

Application	Sort (yes no)	Update (yes No)	Inquiry per

5. Do you maintain a mailing list? How is it used and what frequency?

Application	Quantity per	"	""	"

EXHIBIT VII-2 (Cont.)
TEXT PROCESSING - TASKS

SECTION III

Communications and Document Distribution

1. Do you use courier services?

Name of service	Sent to Location	Frequency

2. What is nature/application for document distribution within the building (local)?

3. What is the nature/application for document distribution outside the building?(remo

4. What security precautions are taken and for what applications/correspondence?

Application	Security Precaution

SECTION IV

Need for Additional Support

1. With your knowledge of Word Processing, what applications do you perform which can be improved with Word Processing?

Application	Yes	No

Note: Make sure the volume of these applications have been included in Section I, II, and III of this section.

2. Do you send documents outside of the company for typing?

Documents/Applications	Frequency	Quantity

3. Do you temporary help for clerical tasks?
use

Application	Frequency	Duration

EXHIBIT VII-2 (Cont.)
TEXT PROCESSING - TASKS

4. Do you use typesetting?

Application	Frequency	Quantity

5. Do you have requirements (outside) for print on both sides of the page?

Application	Frequency	Quantity

6. How much overtime/weekend work is necessary to complete your clerical tasks?

Application	Overtime per week	Overtime weekends per month

- A Summary Table, like Exhibit VII-I, should be constructed.

- The elapsed time, and effort expended to accomplish the identified tasks should be measured:

  - Using existing systems.

  - Using the new system (in this case the 5520).

- Other impacts of the new system should be described; e.g., on the need for microfilming.

- Effort expended will then give direct labor cost comparisons using the "old" and "new" systems.

- The "value" of reduction in elapsed time must then be measured: this should be done by application.

  - Note: This is dependent on the application and can be very difficult to measure. Some things, such as reduction in time to send out invoices, are relatively easy to measure.

- It is important to consider in both systems the impact of major changes in volume. An example of such a change over the last few years is credit card processing and its attendant text processing.

- When considering increases/decreases in staff levels, one-time as well as continuing costs must be considered. Costs such as hiring/firing and training should be included.

- Finally, a value must be placed on impacts not translated into "elapsed time" or "effort expended." These might include:

  - Personnel retention.

- Quality.

- Flexibility of staff.

- Organization changes.

- The "value" of the new system can then be compared to its life-cycle cost and the cost of the old system over the same period.

  - Note: It is important to look at the life cycle so that changes in costs of labor and items such as paper, maintenance, and telecommunications can be properly factored in.